

**SUPPLEMENTAL REMARKS**

As noted in the Response of November 24, 2004, the Office Action mailed on May 24, 2004, has been reviewed and the comments of the Patent and Trademark Office have been considered, the statements of the November 24, 2004 Response being incorporated herein in their entirety.

The comments of Examiner Keith in the in-person interview of January 26, 2005, have also been considered, those comments being paraphrased below.

Applicants respectfully submit that this paper is responsive to the Response to Amendment mailed on February 28, 2005.

Prior to this paper, claims 1-11, 13-14, 16-18 and 24-34 were pending, with claims 6-8, 10, 11 and 13-18 being provisionally withdrawn from consideration. By this paper, Applicants do not cancel or add any claims. Therefore, claims 1-11, 12-14, 16-17 and 24-34 remain pending.

Applicants respectfully submit that the present application is in condition for allowance for the reasons that follow.

**Interview of January 26, 2005 and Substance of the Interview Statement**

Examiner Keith is thanked for extending the courtesy of an interview to Applicants' representatives on January 26, 2005, where it was agreed that he would consider the submission of a document, *as evidence tending to show the patentability of the claims*, demonstrating that it was known at the time of filing that TiO<sub>2</sub> does not always exhibit superhigh-hydrophilic properties and/or that simply because a prior art device teaches the use of a TiO<sub>2</sub> film/coating, the TiO<sub>2</sub> film/coating is not necessarily a superhigh-hydrophilic film/coating. Examiner Keith also indicated that he would consider a document, *as evidence tending to show that the rejections under 35 U.S.C. §112 should be withdrawn*,

demonstrating that an artisan of ordinary skill would have known at the time of filing how to form TiO<sub>2</sub> to obtain super-high hydrophilic properties.

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In view of the in-person interview, Applicants submit that the Interview Summary (a copy of which is attached in Appendix A), along with the above comments, provide a complete and proper recordation of the substance of the interview, per MPEP §713.04.

Applicants again sincerely thank Examiner Keith for extending the courtesy of the in-person interview.

#### **Submitted Documents**

Applicants submit in Appendix B a Journal Article entitled “Recent topics in photoelectrochemistry: achievements and future prospects,” by Tryk *et al.* (hereinafter, the Tryk Article).

Applicants submit in Appendix C U.S. Patent No. 6,228,502 to Saitoh *et al.* (hereinafter the ’502 patent).

\* \* \* \* \*

**The Tryk Article:** In regard to the teachings of the Tryk Article, it is respectfully submitted that the Tryk Article clearly evinces that not all TiO<sub>2</sub> films exhibit superhigh-hydrophilic activity (or even high hydrophilic activity for that matter). Specifically, in section 2.2.1, entitled “*Superhydrophilic surfaces*,” of the Tryk Article, it is stated that “[s]ome types of TiO<sub>2</sub> films exhibit high photocatalytic activity and ***low hydrophilic activity***, while others exhibit the ***opposite tendency***.” (Tryk Article, page 2373, second column, lines 33-35, emphasis added.) It is respectfully submitted that the Tryk Article provides sufficient evidence that not all TiO<sub>2</sub> films exhibit superhigh-hydrophilic activity. Moreover, it is respectfully submitted that the specific teachings of section 2.2.1 and the teachings of the article in general would have enabled one of ordinary skill in the art to obtain a superhigh-hydrophilic TiO<sub>2</sub> film.

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**The '502 Patent:** Applicants respectfully submit that the '502 patent clearly evinces both that TiO<sub>2</sub> with a crystalline orientation film oriented as disclosed therein exhibits superhigh-hydrophilic properties, as compared to TiO<sub>2</sub> without such orientation. Moreover, it is respectfully submitted that the '502 patent sufficiently exhibits that the knowledge of how to implement a TiO<sub>2</sub> film with superhigh-hydrophilic properties to practice Applicants' invention (based on the description in the present application) was known.

The '502 patent teaches that TiO<sub>2</sub> with a crystalline orientation film oriented as disclosed therein exhibits superhigh-hydrophilic properties, as compared to TiO<sub>2</sub> without such orientation. In this regard, Applicants point to col. 1, lines 59-63, when read in view of the preceding language at col. 1, lines 33-47. Specifically, the '502 patent states that the "present inventors have found that the resulting titanium dioxide *crystalline orientation film oriented in the specific direction* is excellent in properties such as an antimicrobial activity, a stain resistance, an *ultra-hydrophilic property* and the like." (Col. 1, lines 33-47, emphasis added.) That is, according to the '502 patent, if TiO<sub>2</sub> film is arranged with a crystalline orientation in "the specific direction" (as taught in the '502 patent), the film results in an ultra-hydrophilic property (*i.e.*, a superhigh-hydrophilic property).<sup>1</sup>

This is opposed to a TiO<sub>2</sub> film detailed at column 1, lines 33-47, in which the crystals are arranged without "the specific direction." These lines detail how in various other methods of TiO<sub>2</sub> film formation, the "crystal structure of the thin film obtained was hardly controlled, making it *impossible to obtain a crystalline orientation film oriented in a specific direction*." (Col. 1, lines 44-47, emphasis added.) Based on the statement on lines 59-63 of the '502 patent, it appears that without a crystalline orientation having the "specific direction," the TiO<sub>2</sub> film does not exhibit superhigh-hydrophilic properties, as opposed to the one that does.

Moreover, the '502 patent provides empirical data regarding hydrophilic properties of the film according to the '502 patent at column 11, lines 28-38, as compared to the "comparative examples 1 and 2," not embodying the teachings of the '502 patent.

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<sup>1</sup> The '502 patent summarizes the titanium dioxide crystalline orientation films as taught therein at col. 2, lines 11-18, of the '502 patent.

In sum, it is respectfully submitted that the above documents are sufficient evidence that the skilled artisan would have known that not all TiO<sub>2</sub> films/coatings exhibit superhigh-hydrophilic properties, and, in fact, some TiO<sub>2</sub> films/coatings exhibit low hydrophilic properties, and thus the surfaces with TiO<sub>2</sub> in Skarpelos are not inherently superhigh-hydrophilic. Skarpelos, therefore, does not anticipate any of the claims nor does that or any other reference render obvious those claims, for at least the reasons detailed in the November 24, 2004 Response. Further, it is respectfully submitted that these documents present sufficient evidence that the ordinary artisan would have known how to implement a super-high hydrophilic TiO<sub>2</sub> coating as described in the present application at the time of filing.

### **Conclusion**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Examiner Keith is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

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Respectfully submitted,

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